Listing of the Claims:

1. (Original) A method of alkylating an aliphatic or aromatic hydrocarbon with an olefin, which comprises contacting the aliphatic or aromatic hydrocarbon with the olefin in the presence of a solid polymeric onium polyhydrogen fluoride complex under conditions sufficient for the alkylation of the aliphatic or aromatic hydrocarbon.

2. (Original) The method of claim 1, wherein the aliphatic hydrocarbon is a C_4-C_{10} saturated, branched hydrocarbon.

3. (Original) The method of claim 2, wherein the olefin is a C_2-C_8 alkene.

4. (Original) The method of claim 3, wherein the alkylation of the aliphatic hydrocarbon produces a high-octane C_6-C_{12} branched alkane.

5. (Original) The method of claim 3, wherein the molar ratio of the saturated, branched hydrocarbon to the olefin ranges from about 2:1 to about 20:1.

6. (Original) The method of claim 1, wherein the aromatic hydrocarbon is a C_6-C_{20} aromatic hydrocarbon.

7. (Original) The method of claim 6, wherein the olefin is a C_2-C_{20} alkene.

8. (Original) The method of claim 7, wherein the alkylation of the aromatic hydrocarbon produces a detergent alkylate.

9. (Original) The method of claim 8, wherein the detergent alkylate is further sulfonated under conditions sufficient to produce a detergent.

10. (Original) The method of claim 1, wherein the solid polymeric onium polyhydrogen fluoride complex comprises a polymeric material containing in some or all of its repeat units a nitrogen, phosphorus, or sulfur atom capable of forming an onium fluoride moiety upon reaction or complexation with anhydrous hydrogen fluoride.

11. (Previously Presented) A method of alkylating an aliphatic or aromatic hydrocarbon with an olefin, which comprises contacting the aliphatic or aromatic hydrocarbon with the olefin in the presence of a solid polymeric onium polyhydrogen fluoride complex under conditions sufficient for the alkylation of the aliphatic or aromatic hydrocarbon, wherein the solid polymeric onium polyhydrogen fluoride complex is poly(vinylpyridinium) polyhydrogen fluoride or poly(aminomethyl)styryl polyhydrogen fluoride.

12. (Currently Amended) The method of claim 1, wherein the solid polymeric onium polyhydrogen fluoride component comprises from about 70 to about 95 weight percent hydrogen fluoride.

13. (Original) The method of claim 1, which further comprises contacting the aliphatic or aromatic hydrocarbon with the olefin in the presence of a Lewis acid halide or a strong Bronstead acid.

14. (Original) The method of claim 13, wherein the Lewis acid halide or strong Bronstead acid is present in an amount from about 0.1 to about 10 weight percent of the solid polymeric onium polyhydrogen fluoride complex.

15-21. (Cancelled).

22. (New) The method of claim 11, wherein the aliphatic hydrocarbon is a C_4-C_{10} saturated, branched hydrocarbon.

23. (New) The method of claim 22, wherein the olefin is a C_2-C_8 alkene.

24. (New) The method of claim 23, wherein the alkylation of the aliphatic hydrocarbon produces a high-octane C_6-C_{12} branched alkane.

25. (New) The method of claim 23, wherein the molar ratio of the saturated, branched hydrocarbon to the olefin ranges from about 2:1 to about 20:1.

26. (New) The method of claim 11, wherein the aromatic hydrocarbon is a C_6-C_{20} aromatic hydrocarbon.

27. (New) The method of claim 26, wherein the olefin is a C_2-C_{20} alkene.

28. (New) The method of claim 27, wherein the alkylation of the aromatic hydrocarbon produces a detergent alkylate which is further sulfonated under conditions sufficient to produce a detergent.